



# **Energy Efficiency Clean Technology**

---

**House Committee on  
Energy and Technology  
May 4, 2005**



# **Energy Efficiency Clean Technology**

---

1. Introduction by Director Steven E. Chester, MDEQ
2. Joint Presentation: Greg R. White, MPSC, and Tino Breithaupt, MEDC
3. Martin Kushler, Ph.D., American Council for an Energy-Efficient Economy
4. James A. Croce, NextEnergy
5. Loch McCabe, Shepherd Advisors, A Shepherd Capital Ventures LLC Business
6. Mark Tholke, General Electric Energy



## **EDGE2 Goals**

---

- **Promote Energy Efficiency**
- **Attract Clean Technology Businesses To Michigan**
- **Support Research And Development Of Clean Technology**



## **Executive Directive No. 2005 - 4**

---

- **Effective April 22, 2005**
- **Energy Efficiency Savings Target**
  - **10% Reduction in Energy Use by 12/31/08**
  - **20% Reduction In Grid-Based Energy Purchases by 12/31/15**
- **DMB to Implement Energy Conservation Measures in State Facilities**
- **Changes in Vehicle Fleet: Hybrids & Use of Alternative Fuels**



## **Michigan Public Service Commission**

---

### **Role in Alternative Energy**

**GREG R. WHITE  
MPSC STAFF**



### **MPSC Role in Renewable Energy**

---

- Section 10r(6) of 2000 PA 141 directs MPSC to “establish the Michigan Renewables Energy Program... to inform customers of the availability and value of using renewable energy generation and the potential for reduced pollution... promote the use of existing renewable energy sources and encourage the development of new facilities.”



## Utility Renewable Energy Offerings

---

- 6 MPSC-regulated utilities offer voluntary green rate programs: Cloverland Coop., Consumers Energy, Edison Sault, We Energies, Upper Peninsula Power, & Wisconsin Public Service
- Consumers Energy & Detroit Edison are presently developing new programs
  - Consumers is now reviewing bids for new, in state, green power supplies.
  - Edison is now reviewing bids for a 3<sup>rd</sup> party supplier/marketer to operate its new green rate program.



## Capacity Need Forum

---

- MPSC established CNF process in U-14231
- Interim report due July 1, 2005. Final report January 1, 2006.
- CNF will assess how Michigan renewable energy potential can be blended with all other supply & demand options, to develop the best "balanced portfolio" by 2020 and beyond



## NextEnergy Goal

---

- To position Michigan as the world's leading convergence center for alternative energy technology, research & development, education and manufacturing
- Stationary, mobile and portable technology applications
- Hydrogen fuel cells, methanol, ethanol, wind and solar



## NextEnergy Legislation and Incentives

---

- 2002 Legislation
  - Creation of NextEnergy Authority to certify companies for tax incentives
  - SBT exemption through phase-out
  - Personal property tax exemption through 2012
  - Renaissance Zone creation – no state or local taxes and personal income tax credit to company for 20 years



## MEDC/NextEnergy Partnership


- More than 130 AET Companies identified in Michigan
- Retain, Grow and Attract companies, high-skilled jobs and private investment in Michigan
- Marketing and communications
  - Develop and deliver marketing campaign for the State of Michigan as a leader in AET



## Energy Efficiency Clean Technology

**MARTIN KUSHLER, Ph.D.  
DIRECTOR, UTILITIES PROGRAM  
AMERICAN COUNCIL FOR AN  
ENERGY-EFFICIENT ECONOMY**

**See separate presentation**




## Alternative Energy Options

---

### Emerging Technologies

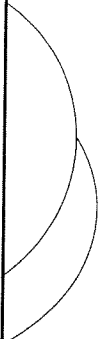
- Renewable power plants (wind, solar, biomass)
- Renewable fuels (energy crops, manure)
- Waste fuels (Municipal, industrial)
- Synthetic fuels
  - Coal gasification; coal gas to liquids
  - Biomass to liquids; natural gas to liquids
- Hydrogen/fuel cells



## Benefits of Increased Renewable Energy Penetration

---

- Shift state balance of trade deficit by utilizing indigenous resources
- Reduce vulnerability of our energy system
  - Larger number of distributed resources
  - Reduces fuel imports (LNG – 16X increase projected)



## Why Incentive Alternative Energy (cont.)?

---

- Societal benefits such as reduced pollution and national security are not reflected in market prices
- Higher transaction and financing costs
- Split incentives among multiple constituents



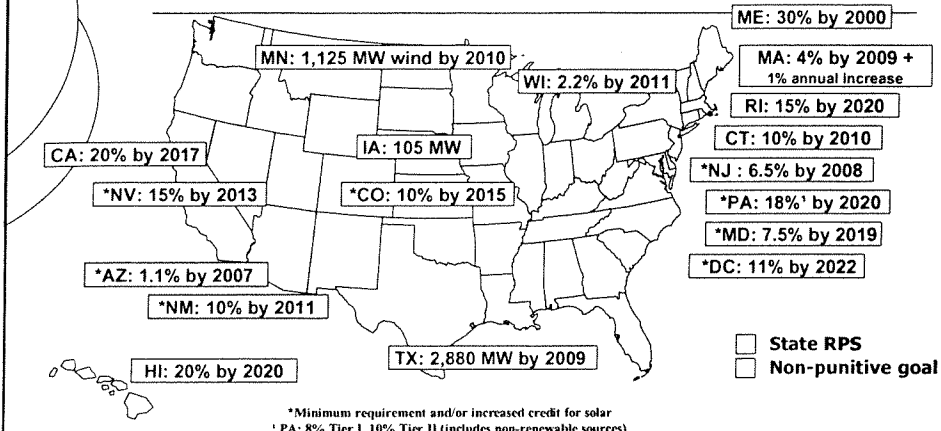
## Renewable Energy & Job Creation

---

- More dollars remain in Michigan's economy
  - "Multiplier" effect
- Provides new income sources to rural communities
  - Energy crop production, lease revenue, value-added products
- Provides new manufacturing opportunities
  - Including exports (esp. to developing world)
  - Michigan has been identified as among the top 20 states for wind and solar component manufacturing potential (REPP, 2005)
- Provides new R & D, engineering, construction, and maintenance jobs



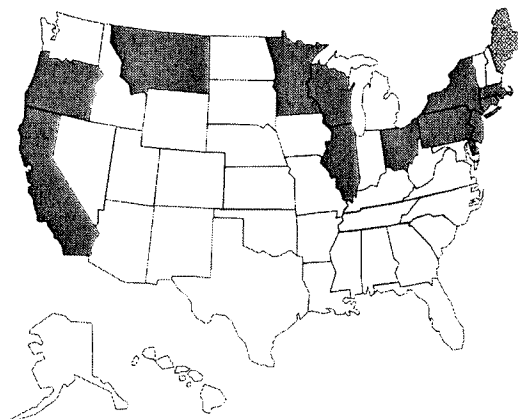
## Example Policy: Renewable Portfolio Standard (RPS)




Interstate Renewable Energy Council, January 2005

## Example Policy: Public Benefits Funds (e.g. Michigan's LI/EE Fund)

*Public Benefits Fund Map (Dec 2004)*  
(Not Shown: DC)



- ☐ State has a PBF for renewables
- ☐ Funding through voluntary contribution



---

## **Appendix:**

### **Overview of NextEnergy**



---

## **What is NEXTEnergy?**

- Non-profit corporation founded by the State of Michigan to advance the AET industry
  - Renewable energy, clean fuels, distributed generation
  - Automotive, stationary, and portable applications
- Objective: Create/retain high tech jobs, by ...
  1. Encouraging "energy security through diversity"
  2. Being the "honest broker"
  3. Supporting technology R & D and commercialization

## Major NextEnergy Programs

---

- Education curriculum development
  - \$1,300,000 grants committed to 7 Colleges/Universities
  - Over 1500 enrolled since piloted in 2004
- Industry working groups
  - Hydrogen Infrastructure
    - Ford, DaimlerChrysler, DTE, EPA, British Petroleum
  - Hydraulic Hybrid Vehicles
    - Eaton, Dana, Borg-Warner, Southwest Research, US Army/TACOM, Altair Engineering, Hybra-Drive, Knusaga, UM
  - Bio-fuel specification research
    - DaimlerChrysler, Robert Bosch, Biodiesel Industries, Wayne State University, US Army/TACOM
  - Southeastern Michigan Clean Cities (pending)

## Major Programs (cont.)

---

- DOE Fuel Cell Vehicle and Infrastructure Validation
  - 5 Year (\$650,000) program supporting Automotive OEM's
  - Codes and Standards best practices at US H2 infrastructure installations
- SBIR grant support
  - \$400,000 pending to 3 Michigan entrepreneurs
- Federal research funding acquisition (\$13.6 MM to date)
  - Managed by NextEnergy and dispersed primarily to MI cos.
  - Hydrogen: \$3.0 Million
  - Bio-diesel: \$2.0 Million (National Biodiesel Energy Laboratory)
  - Military/Homeland Defense: \$8.6 Million



## Presentation Overview

---

- What is “Clean Tech”?
- Why focus on Clean Tech?
- Michigan’s Clean Tech Landscape . .
  - Entrepreneurs
  - Challenges
  - Opportunities
  - Best Practices



## What is “Clean Tech”?

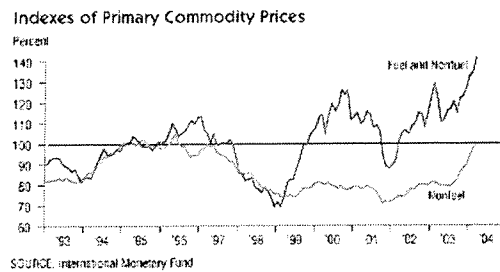
---

- Short for “Clean Technology” ... *a product, process or practice that increases economic and social value and environmental quality at the same time through more efficient and effective use of natural resources.*
- “Clean Tech Marketplace” includes . . .

Clean manufacturing	Alternative energy
Water conservation/purification	Energy efficiency
Pollution prevention	Recycling/recovery
Green products	Green construction
Sustainable transportation	Green chemistry

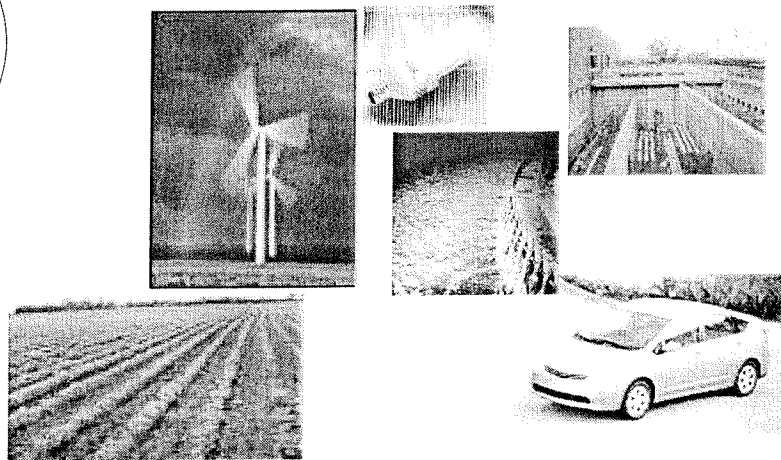
## Our Changing Markets

- Rising Material Costs
- Emerging Markets



- Kyoto Protocol
  - Ratified by 122+ countries (Including Canada, Mexico, W. Europe, Russia, China, India)

## Our Changing Opportunities



## Michigan's Clean Tech Landscape ... Companies

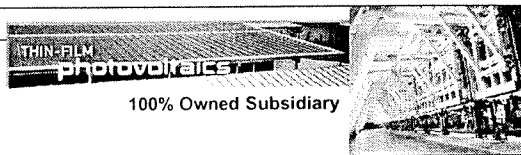
- Some leading emerging clean tech companies
  - Energy Technologies
  - Water Technologies
  - Material Technologies



**Energy Conversion Devices, Inc.**

[www.ovonic.com](http://www.ovonic.com)

**UNI-SOLAR**  
United Solar Ovonic LLC



- Develops and sells cutting-edge energy technologies
- Selling solar power worldwide
- Manufactures NiMH batteries used in hybrid cars
- Over 650 employees



50/50 Joint  
Venture with  
ChevronTexaco



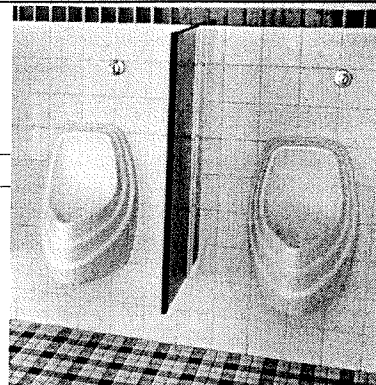
**FALCON**  
WATERFREE TECHNOLOGIES

### Important new technology

- Great for the environment, saves money, and more hygienic
  - Saves 40,000 gallons of water per urinal/yr.
  - Save energy and treatment capacity
  - Reduces CO<sup>2</sup> emissions
  - Qualifies for LEED points

### Innovative young company

- Moved to Grand Rapids from California in 2003
- Over 30,000 urinals sold in U.S. & 50,000 worldwide
- Sales more than doubled in 2004 with potential to grow 10x in 5 years
- Named a "21 Companies to Watch in 21st Century"



*Michigan installations include:*



MICHIGAN STATE  
UNIVERSITY



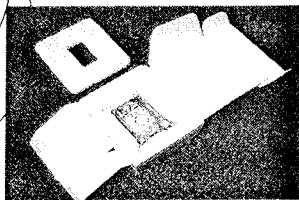
**KTM Industries, Inc.**

5597 W. Grand River Ave.

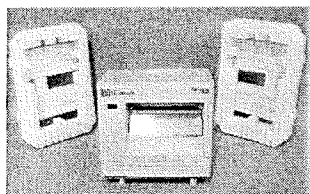
Lansing, MI 48906

Phone: 517-703-9140

Website: [www.ktmindustries.com](http://www.ktmindustries.com)



Sony PS/2 Game & Hard Drive



- Foam packaging and insulation products made from cornstarch
- Technology developed at MSU
- Growing sales. Customers include Toyota and Sony
- Same price/performance ratio as PE
- Economics improve as oil cost rises
- Located in Lansing, MI

## Michigan's Clean Tech Landscape ... Opportunities



- *Clean Cars*
- *Industrial energy efficiency*
- *Biomass fuels & products*
- *Off-Shore wind power . .*
  - Saginaw Bay & Thumb are Major wind resources
  - Wind turbine manufacturing?
  - "Free" Fuel and Jobs
  - Pennsylvania did it!

## Michigan's Clean Tech Landscape ... Challenges

- **Lack of Access to Local Michigan Markets**
  - 18 Other States have renewable energy standards & goals
  - Energy efficiency, co-generation, & biomass face well entrenched resistance and many unnecessary barriers
  - Manufacturers are more willing to cut jobs than to improve productivity
  - State government hasn't cared (until recently)
- **Lack of Access to Capital**
  - \$1.2 billion of venture capital in 2003.
  - \$19 million invested in Michigan (1.6% of total)
  - California had 30x more DOE SBIR I Awards in 2004

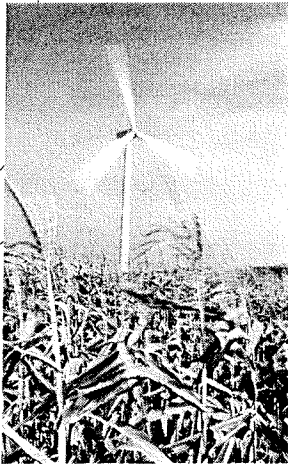


## **Wind Energy in MI: Opportunity for Leadership**

**Mark Tholke**  
**Senior Associate,**  
**Regulatory Affairs/Marketing**  
Mark.Tholke@ge.com  
925.750.6112



## **Market Drivers**



- **Bipartisan Government Support & Policy Incentives**
- **Hedge for Natural Gas Price Volatility**
- **Entry of Established Players**  
(manufacturers: GE, Siemens;  
developers: FPL, PPM, Goldman  
Sachs, AES)
- **“No significant grid integration or  
reliability impacts”**

## Rural Economic Development – Landowner Royalties

---

Typically, wind plants lease land and pay landowners royalty fees based on power generated. Agricultural acreage remains productive aside from footprint of turbine foundation.

- 2.5% of gross revenues = \$2000-\$3000 per turbine per year
- CO study: landowners received \$3000-\$6000 per turbine per year
- TX study: 1100MW generated \$2.5M landowner royalties in 2002

## NYSERDA Report (March 2005) Yields Surprising Results

---

- New York State can reliably accommodate at least 10% penetration, 3300MW, with no significant integration costs or reliability impacts
- Simulation results demonstrate that overall stability performance of the bulk power system is better with 3300MW state-of-the-art wind generation than it is without

